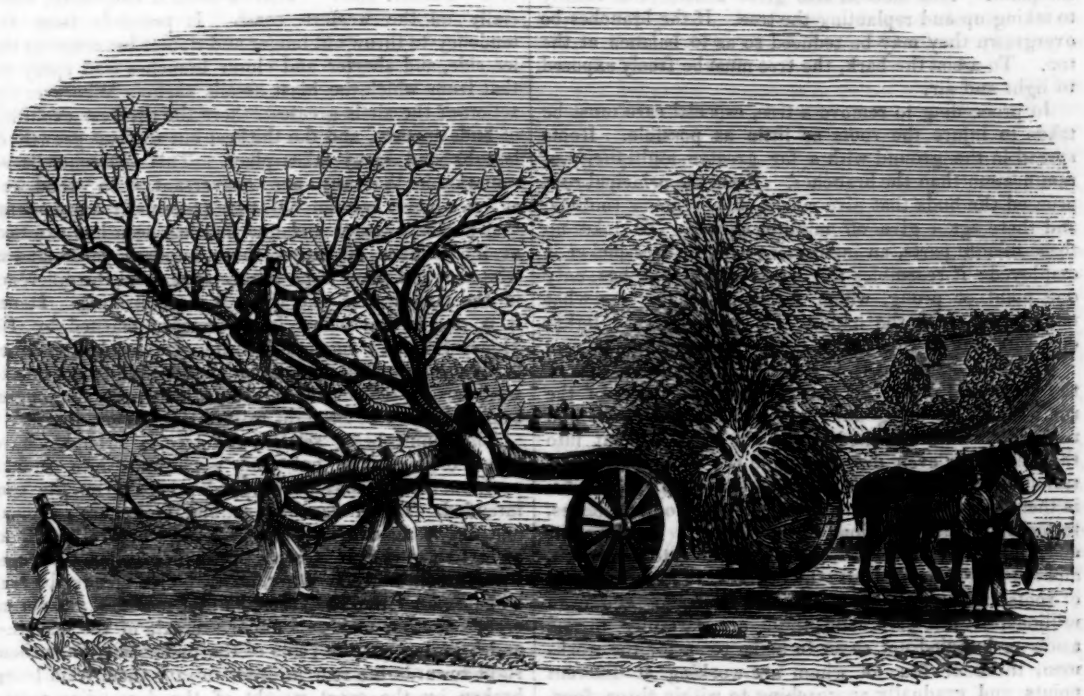
THE

Saturday Magazine.

No. 688. MARCH 25TH, 1843. { PRICE ONE PENNY.

THE TRANSPLANTING OF FULL-GROWN TREES.



THE TRANSPLANTING MACHINE MOVING A BEECH TREE.

II.

THE method of transplanting invented by Sir Henry Steuart is called the "Preservative," in contradistinction to the "Mutilating," method, so justly complained of in a former article. The inventor of the new method considered all the circumstances under which trees grow, and endeavoured in his operations to place the tree with respect to external and internal circumstances precisely the same as before removal.

In the selection of subjects for transplanting attention must first be directed to the adaptation of trees to their proper soils. The sycamore, the lime, or the wild cherry do not grow naturally in a clayey soil, and must not be transplanted into one:—the oak and the elm do not thrive on light sand or gravel, but, on the contrary, on the deepest and loamiest land, and in the case of the oak, even on a clay bottom. The nature of the subsoil is of great importance as influencing degrees of moisture. In fact, although the art of transplanting full-grown trees may be said to be perfect, it by no means follows that trees can be moved from one situation, and placed at pleasure, however carefully, in *any* other, for it often happens that where the planter is anxious for the grand effect of the oak or chesnut he must be content with the inferior forms of the lime or the beech. Sir Henry Steuart gives a sensible maxim on this point, viz., that those trees about a place will always look the handsomest that thrive the best, and no peculiarity of ramification nor delicacy of foliage can ever compensate for a deficiency of luxuriant and full health.

Another error in the selection of trees for transplanting is in taking them from the close shelter of woods and plantations, and placing them in an open park, where they are exposed on all sides to the severities of the climate, and consequently soon sicken and die. A similar want of judgment is observable in selecting young and tender plants from the nursery, and placing them singly in the open field without any regard to shelter.

An important element in the success of the new method is that the soil into which the trees are transplanted is to be of a superior quality to that from whence they were taken, or at least that portion of it applied immediately to the rootlets should have an addition of good manure. In the selection of subjects particular attention is directed to the following points;—1st., the tree should have a superior thickness and induration of the bark compared to that of trees which have grown up in a crowded state; 2nd., stoutness and superior girt of the stem; 3rd., numerousness of roots, fibres, and rootlets; 4th., the extent, balance, and closeness of the branches. If a tree, otherwise desirable, does not possess these *protecting* properties, it must be provided with them previous to removal. If the branches be tolerable, but the roots deficient, they are cut round, and the lateral growth encouraged: if the deficiency be in both branches and roots, a quantity of peat compost mixed with tolerable soil of an opposite quality to that of the ground where the tree stands, is to be applied in a direction sloping outwards from the tree to the extent of the roots. Into this loose mould the genial rays of spring will enter, and carrying with them carbonic acid from the atmosphere, render the whole the most desirable food for the plant. Thus excited, the fibrous roots, which always strike upwards, will during the first year nearly

pervade the mass: by which means both the root and the branches will soon be improved, and after the third or fourth season the tree will be fit for removal. This effect on the roots may also be produced by cutting a trench round the tree at a proper distance from the stem, and filling up the trench with good soil and manure: in two or three years the roots will be increased to a much greater extent than could be produced by unassisted nature, and these roots act as so many additional mouths, and take up food proper for the nourishment of the plant. This method also gives considerable facility to taking up and replanting the tree. If the branches be overgrown they may be reduced so as to balance at the top. To assist the bark, the tree must be freely exposed to light and air.

In proceeding to remove a tree, especial care must be taken to injure the roots as little as possible. Roots spread in the ground with a far greater multiplicity of ramification than the branches. From the principal root proceed the buds that give rise to the primary rootlets, and these again give off minuter shoots. To take up these minute parts, an instrument called a tree-picker is employed: it resembles the miner's pick, but has only one point or prong, which forms an angle somewhat more acute with the handle. It is made very light; dexterity, rather than force, being necessary for its use.

The first operation is begun with the cautious use of the spade and picker, to find the extreme points of the rootlets. This being done, a trench, between two and three feet wide, is opened round the tree, and cut into the subsoil, or even deeper, should the roots have penetrated so far. The bank in which the roots seem to lie, is then undermined to the extent of eight or ten inches, to facilitate the operations of the picker. As the roots and rootlets are extricated, the mould falls into the trench, and must be shovelled out: by degrees, an immense body of roots and rootlets, amounting to thousands and even millions, is disclosed, and these are carefully turned aside or bundled up, so as to make room for the workmen, three or four of whom are working at different points, and gradually approaching to within three, four, or five feet of the stem of the tree. And here the process of extrication ceases, as it would be imprudent to advance nearer. A fall of earth is left round the stem, of as large a size as the nature of the soil will permit; and also a quantity of the original green sward, both of which if they can be taken away with the tree, will assist future operations.

The tree may now be left for a time, taking care to protect the exposed roots by covering them over with small branches of spruce fir, and turf; or it may be removed at once to the pit of prepared soil, previously got ready for its reception.

The transplanting machine being brought up to the tree, and the bar lashed to the trunk, a rope is passed round it, and with the assistance of a horse the tree is pulled down into a horizontal direction, and nicely balanced on the pole, with many precautions and dispositions best understood by reference to the cut, which shows the machine in motion, bearing a beech-tree twenty-eight feet high, with a stout stem, a beautiful top, and roots more than twelve feet long The persons seated in the tree and engaged about it, perform the useful offices of steersman, balancemen, &c., every possible means being taken during the transit to prevent injury to the roots and branches.

Having arrived at the spot destined for the reception of the tree, the director of the work ascertains that the root and the pit fit each other. A bed is tnen prepared in the centre of the pit for the reception of the tap roots. Care must be taken to set the tree in the pit as shallow as possible, allowing sufficient food for the downright roots, and sufficient cover for the other roots; but arranging so that all the roots may have the influence of air and moisture.

For the reception of trees of about thirty feet in height the pits are about eighteen feet in diameter. The earth of the pits is trenched to the depth of about two feet, and well mixed with compost of a different nature to that of the soil; the ground thus prepared is improved by lying for a year or more, in order that the component parts of the soil may be properly mixed and mellowed.

In removing and transplanting a tree, attention must be paid to its "weather side." Almost all trees are unequally balanced, and show in their tops more or less of a "weather side." This is often a deformity, especially on the western coast. It proceeds from the tendency to throw out longer and stouter branches on the lee side, and shorter and closer branches and spray on that from which the blast assails them. Wherever the action of the air is greatest, there the greatest evolution of buds appears, and the thickest but weakest growth of boughs and spray takes place. This difference is so remarkable that any one conversant with wood can at once point out an old tree (especially a sycamore) that has been more and one that has been less exposed, at the distance of two or three hundred yards, and in winter, when there is no foliage to conceal the difference in the ramification, the thing is more striking. Hence it is one of the many improvements effected by Sir Henry Steuart's method to bring this decided tendency to elongation of the boughs on the lee side to act on the windward or deficient side, or in other words, the longest branches must be brought to face the stormy quarter.

This point being settled, the tree is brought, by a series of ingenious but easy evolutions, into such a position that it may be dropped precisely on the spot intended. The cords which confine the top are removed, and the branches allowed to gain their natural position: an active workman is sent to the top to fix two ropes transversely to each other, in order to steady the tree when freed from the transplanting machine and set up erect; another man gets under the axle of the machine, and bringing out the roots of the under side, pulls them right towards the rear in order to save them from being broken by the great weight of the descending mass: when on a signal being given, the stearsmen and his assistants, together with the balancemen, quit their stations and their hold of the pole, rope, and branches, and the tree suddenly rises to the upright position.

The position of the tree is then nicely adjusted, the transverse ropes are stretched to their utmost extent by one or two stout hands to each, in order to balance the tree and set it straight, so that it may please the eye and be firmly secured against the wind. The proper depth being regulated, the workmen seize such of the lateral roots as are long and flexible, and holding them carefully aside, expose the under bed of the roots; the finest sort of mould is to be thrown in so as to form a bank, sloping outwards, against the roots, and this bank is to be firmly trodden down. One man carefully fills in and equalizes all the hollows and vacancies, while another man with a small blunt-pointed stake pushes in the mould, and makes it firm in the cavities which the foot cannot reach. By thus diligently and firmly bolstering up round the nucleus, but yet underneath and quite clear of the great body of the roots and fibres, a sort of circular "retaining bank" is formed, which is capable of such resistance to the action of the top, that a stout man on applying his force to the transverse ropes will find it difficult or even impossible to displace the root, even with such a lever as the stem must afford him. This method of giving stability to the tree before any cover whatever is laid upon the roots is truly the *planting* of the tree, and is one of the peculiar advantages of the preservative system.

The roots, which are often from twelve to fourteen feet long, are now to be disentangled and stretched out in the most regular manner from the centre, and the thousands of fibres, *combed out*, as it were, with the

fingers, are made to cover the ground with regularity, and as nearly as may be in the same order in which they were taken up: this is a nice and difficult operation, and may require that the pit be enlarged, the great object being to afford ample space to the roots, so that they may proceed in search of food in the natural way. The different layers of roots are to be imbedded in mould, and gradually consolidated into a mass sufficiently compact, yet porous, through which heat and moisture may have free access to the fibres, and where evaporation may proceed without obstruction. If the tree have been transplanted between November and February, a slight treading over of the soil may be sufficient. If in Spring, between February and May, water may be dashed upon the roots when the covering of mould is about half finished, so as to wash it among the roots of the plant. In this way, "the roots have as good and ample range of pasturage on the fine mould which has been prepared for them as they had in their original situation, and in many cases a great deal better."

By this method it is not necessary to prop a tree after removal. In the course of thirty years Sir Henry Steuart has not had a single tree blown down; and as to deaths, the average mortality has been about one in forty or forty-five.

When the operation of transplanting is quite complete, attention must be directed to the soil, and provision made for consolidating it, in order to retain moisture, &c.: the rammer may now be used with benefit; a layer of moss may be applied round the stem, and the surface of the mould being levelled and dressed may be prepared for grass seeds. When they are sown and raked in, a roller is to be passed over the surface; they will spring up rapidly, and be of great use in retaining moisture. To cover so considerable a space with turf would be too laborious, and not be so effective or so handsome in its result.

If, during the year or transplanting, the tree bear a healthy leaf though smaller than usual, the operation may be considered as successful, except in the case of the oak and the beech, which have been known to fail in the second year. During the first two or three years the earth in the vicinity of the tree may be slightly raked and top-dressings applied, by which means a great stimulus is imparted to plants which are just recovering from the process of removal; and there are few trees that will not shoot forth with a vigour which the most sanguine planter could scarcely have anticipated.

The guards which are usually applied to young trees are very expensive and very ugly. Sir Henry admits sheep only to graze in his park, and his defence to the trees is composed of stakes of larch wood driven into the ground, and matting, the whole firmly bound with marline half-twisted and pitched. The cost of such a guard is about sixpence, and while it effectually protects the tree does not at all interfere with its beauty of appearance.

The trees transplanted in Winter must, in the absence of showers, be watered during the following Spring and Summer; and if the trees do not shoot well a liquid manure or some good compost may be usefully applied.

With regard to the expense of this method, a few details may be valuable. If a tree removed to the open park be from fifteen to eighteen feet high, and from eighteen to twenty-four inches in girth, which Sir Henry states is the smallest tree that has strength to resist the elements, and if the distance it is carried be about half-a-mile, then the expense is not on an average found to exceed six or seven shillings. If the tree be from twenty-five to thirty feet high, and from three to three and a half feet in girth, the expense is not found to be more than twelve or thirteen shillings. Sir Henry has scarcely known an instance in which plants of the largest size cost more than from fifteen to eighteen shillings.

For the various plans for transplanting trees in masses and on uneven ground; also for transplanting underwood and bushes, and for "composing copse wood," together with a variety of details on the general physiology of trees and other matters most interesting to the planter, the farmer, and even to the general reader, we must refer to Sir Henry Steuart's treatise, to which we have to acknowledge our obligations for this brief outline.

The success of this method has been so complete that Sir Henry's example has been followed by many other proprietors in the uplands or central part of the south of Scotland. That portion of the island is generally deficient in timber; and as the country is pastured by sheep, which require closer and more elevated fences than cattle, the rearing of wood by ordinary planting is expensive.

The nakedness of that part of Scotland is severely felt in the violence of the winds, which are certainly more tempestuous, and attended by more intense cold, than in some places of the country much further to the north,—the snows never falling to the same depth, or being accompanied by the same violence, on the Grampians in Perthshire, as upon the naked mountains in the counties of Selkirk and Peebles. In this part of the country, therefore, the invention by Sir Henry Steuart is of the utmost value. Nor is its value confined to those districts in which wood is wanted; for there is much in the disposition of trees, not only as respects beauty, but as regards usefulness: and by Sir Henry's plan growing timber may be moved at no very great expense, from one place to another, and that without almost the least interruption of its growth.

POWER OF LETTERS.

WHILE we were waiting for fresh horses before a little inn kept by a Jew, at the station next Tyerhova, one of the tribe of Israel came up and asked us if we would like to see some curious rocks, only a quarter of an hour from the village. As we followed him to the spot, he asked those questions, as to where we came from, what we were doing, and whither we were going, so common in most countries except our own, where they are avoided, as though every one was doing something of which he is ashamed, and which he desired to conceal. On hearing that we were English, he asked very earnestly if one Walter Scott was yet living, and expressed the greatest regret when he learnt his death. Surprised at such a sentiment from such a man, and suspecting some mistake, I inquired what he knew of Scott; when he pulled from his pocket a well-thumbed German translation of *Ivanhoe*—the very romance of persecuted Judaism—and assured me he had read that and many others of his works with great pleasure. I do not know that I ever felt more strongly the universal power of genius than when I found the bard of Scotland worshipped by a poor Jew in the mountains of Hungary.

It is astonishing to an Englishman who knows how ignorant even well-informed persons of his own country are of the literature and politics of a great part of the Continent, to find the names of the best authors of England familiar as household words among nations of whose very existence the greater part of that country is scarcely aware. In Hungary, this fact struck me with more force even than in Germany, though the taste for English literature is there immeasurably more advanced than in France or Italy. But the Hungarians, with very little literature of their own, and generally possessing a knowledge of several foreign languages, are not only entirely thrown on the resources of others for their mental food, but are thus eminently well-provided with the means of enjoying it. In many cases, I have found the originals in English, but in general they are read in excellent German translations. With what ecstatic pleasure have they told me of the new light which English literature opened to them! with what admiration have they spoken of the strong and vigorous train of thought which pervades our authors, of that scrupulous decency which they observe, of that warm love of nature they express, and of the universal respect in which religion is upheld by them! A great cause of this extension of English literature has been the judicious selection and the cheap form in which Galignani and other foreign booksellers have published the standard English works; and however disadvantageous this traffic may have been to the pockets of British authors, I am quite sure it has been a very important means in establishing and diffusing their own and their country's reputation. —PAGET's *Hungary*.

EASY LESSONS ON REASONING.

Lesson II.

§ 1. We have said that in all subjects, and on all occasions, the Reasoning-process is in itself the same. Whether you are occupied in *refuting* an opponent, or in conveying *instruction*, or in satisfying your own mind on any point,—and again, whatever kind of subject-matter it is that you are engaged on,—in all cases, as far as you are (in the strict sense of the word) *reasoning*,—that is, employing Argument—it is one and the same process (as far as it is *correctly* conducted) that is going on in your mind.

And what this process is, must be the next point to be inquired into.

Although (as has been said) all men do occasionally reason, they are often, at the time, as *unconscious* of it, as of the circulation of their blood, and the various other processes that may be going on within the body. And even when they do knowingly and designedly use arguments, or are listening to those of another, they will often be as much at a loss to explain *why* one argument appears to them strong, and another, less strong, and another, utterly worthless, as if the whole were merely a matter of *taste;* like their preference of one prospect, or one piece of music, to another.

In order then to obtain correct rules for forming a judgment on this subject, and clear expressions for explaining such judgment to others, it is necessary to *analyse*,—as it is called,—(that is, take to pieces) the Reasoning-process. And for that purpose, we should begin by examining the most plain, short, and simple arguments, and inquiring on what it is that their *validity* [or conclusiveness] depends; examining also some of those apparent-arguments which are *not* valid, and therefore are not, in reality, arguments, at all; tho' they are often passed off for them, as counterfeit coin is, for genuine.

§ 2. You will perceive on examination, that what is called a "Conclusion,"—that is, a Proposition proved by Argument,—is drawn, in reality, from *two* other Propositions. And these are called its "Premises;" from their being (in natural order) "*premised*" or put before it.

At first sight indeed, some might suppose that a Conclusion may follow from one Premise alone. For it happens oftener than not, that only one is *expressed*. But in this case there is always another Premise *understood*, and which is suppressed from its being supposed to be fully admitted.

That this is the case, may easily be made evident by supposing that suppressed Premise to be *denied;* which will at once destroy the argument. For instance, if any one, from perceiving that "the World exhibits marks of design," infers [or, concludes] that "it had an intelligent Maker," he will easily perceive on reflection, that that he must have had in his mind another Premise also; namely, that "whatever exhibits marks of design had an intelligent Maker:" since if this last proposition were *denied*, the other would prove nothing.

§ 3. Such an argument as the above, when all the three propositions are stated at full length, and in their natural order, is called a "Syllogism." And this is the form in which all correct reasoning, on whatever subject, may be exhibited.

When one of the Premises is suppressed, [or, *understood*] which, for brevity's sake is usually the case, the argument is called, in technical language, an "Enthymeme:" a name derived from the Greek, and denoting that there is something left out, which is to be *supposed* [or understood] as being well-known.

It is to be observed, that, when an argument, stated in this last form, is met by opponents, their objection will sometimes lie against the *assertion itself* that is made; sometimes, against its *force* as an argument. They will say either "I deny what you *assume*," or "I admit indeed what you say, but I deny that it *proves* your conclusion." For instance, in the example above, an atheist may be conceived either denying* that the World does exhibit marks of design, or again, denying† that it *follows* from thence that it must have had an intelligent Maker

Now you are to observe, that these are not in reality objections of different kinds. The only difference is, that, in the one case, the *expressed* Premise is denied; in the other, the *suppressed* Premise. For the *force* as an argument, of either Premise, depends on the other Premise. If either be denied, the other proves nothing. If both be admitted, the Conclusion regularly drawn from them, must be admitted.

§ 4. It makes no difference in respect of the sense of an argument, whether the Conclusion be placed last or first; provided you do but clearly mark out what is the Conclusion.

When it is placed last, (which is accounted the natural order) it is designated by one of those conjunctions called "*illative*," such as "therefore,"—"thence,"—"consequently."

When the Conclusion is put first, the Premise is usually called the "Reason;" and this is designated (whether it come last or first) by one of the conjunctions called "*causal*," such as "since,"—"because," &c.

And here it is to be observed that each of these sets of conjunctions have also another sense; being used to denote, respectively, sometimes "Premise and Conclusion,"—sometimes "Cause and Effect." And much error and perplexity have often been occasioned by not attending to this distinction.

When I say "this ground is rich; because the trees on it are flourishing;" or again, when I express the same sense in a different form, saying, "the trees on this ground are flourishing; and therefore it must be rich," it is plain that I am employing these conjunctions to denote merely the *connexion of Premise and Conclusion;* or (in other words) I am implying that the one may be *inferred* from the other. For it is evident that the flourishing of the trees is not the *cause* of the ground's fertility, but only the cause of *my believing* it. The richness of the soil *follows as an inference* from the luxuriance of the trees; which luxuriance *follows as an effect* [or, *natural* consequence] from the richness of the soil.

But if again, I say "the trees flourish because the ground is rich," or (which is the same in sense) "the ground is rich, and consequently [or therefore] the trees flourish," I am using the very same conjunctions in a different sense; namely, to denote the *connexion of Cause and Effect.* For in this case, the luxuriance of the trees, being a thing evident to the eye, would not need to be *proved;* and every one would understand that I was only *accounting for it.*

§ 5. But again, there are many cases also in which the *Cause* is employed as an *Argument*, to prove the existence of its Effect. So that the Conclusion which *follows*, as an *Inference*, from the Premise, is also an Effect which *follows naturally* from that same Premise as its Cause.

This is the kind of argument which is chiefly employed when we are reasoning about the *future:* as for instance when, from favorable or unfavorable weather, any one infers that the crops are likely to be abundant, or to be scanty.

In such cases, the *Cause*, and the *Reason* [or Proof] coincide; the favorable weather being at once the Cause of the good harvest, and the Cause *of our expecting it.*

And this circumstance contributes to men's often confounding together "Cause" and—what is strictly

* As many of the ancient atheists did.
† As most of the modern atheists do.

called—"Reason;" and to their overlooking the different senses of such words as "therefore," "thence," "consequently," &c., and again, of such words as "because," "inasmuch as," &c., and also, of the words "follow," "consequence," and several others; which have all of them that double meaning which has been just explained.

INSECTS INJURIOUS TO THE FARMER.

I.

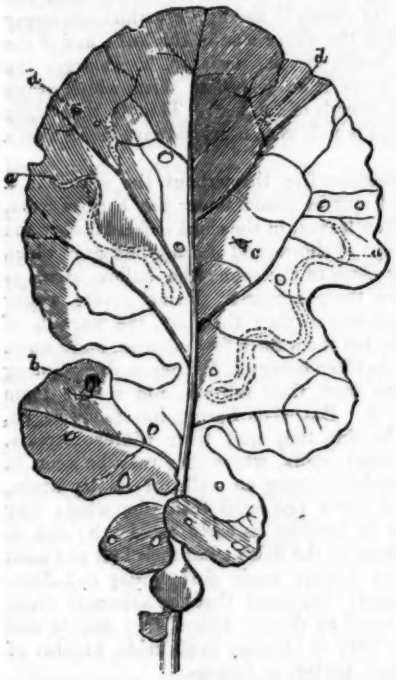


Fig. 1.

A Turnip-Leaf.

a, the burrows formed by the caterpillars.

b, a male beetle feeding.

c, a female beetle at rest.

d, holes recently eaten by the beetles.

THE natural history and economy of those "living atoms," which so greatly lessen the value of the farmer's labours, must be studied with care and perseverance in order to produce beneficial results to his crops. Unimportant as insects may appear to the casual observer, their depredations are of a fearful character when whole armies of them take possession of a field; and the anxiety and loss which they occasion are so great that the farmer cannot be indifferent to the information which scientific men have collected on the subject; for it is only by a complete knowledge of the nature of the disease that the physician can hope to devise a remedy and effect a cure. Nor is the subject devoid of interest to any one of us, whether we inhabit the crowded city or the quiet village; whether we exercise the mechanical arts, or cultivate the ground; we pray for the success of the farmer when we petition the Almighty to "give us this day our daily bread."

One of the great arts of the farmer is by a judicious system of manuring and changing crops to sustain the vigour of the soil so as to produce healthy crops; but with all his skill in selecting manure and resting the land—it will, (as Mr. Curtis says,) become tired at last, and by degrees refuse to produce certain crops nearly altogether: it is even asserted of the turnip that it certainly does not grow so vigorously nor so readily as it did several years ago.

In proportion, then, as the crop is feeble it is susceptible of disease, and as insects are among the most fatal sources of disease, it is important to consider the circumstances under which crops are attacked, with a view to the discovery and adoption of efficient remedies, instead of following blindly the numerous and often expensive suggestions with which the farmer is so frequently tempted.

In some valuable articles communicated by Mr. Curtis to the *Journal of the Royal Agricultural Society of England* on this subject, and from which our information will be principally derived, the author prefers to direct attention to the different insects which effect the turnip-crop, for the following reasons:—*first*, because the turnip is a root of the greatest importance to us all; for, as he remarks,—

Without turnips, our sheep and cattle would be deprived of one great resource, so that we should be almost unable to procure fresh meat in winter, most essential to the health of man; and the land again would lose that fertility which in feeding off the turnip we secure for the succeeding crop.

Secondly, because no crop is subject to the attacks of a greater number of insects, &c., than the turnip.

First, the ants run off with an incredible quantity of the seeds; then come two sorts of turnip-fly, the striped and the brassy, which destroy the tender leaves as soon as they burst from the ground; at the same time, we have the maggot of a fly and the wire-worm, both living upon the young roots, and also a large caterpillar or grub, when they are more advanced; then follow armies of black caterpillars, reducing the leaves to skeletons, and the blight of the plant-louse, together with a minute moth; we may add also two weevils, which cause the humps or excrescences on the bulbs; with slugs, snails, and mildew bringing up the rear.

From this formidable list we select the turnip-beetle as the subject of our present article; but it will be useful first to remind the reader of the several states or changes which, with very few exceptions, mark the life of every insect:—I., the female lays an *egg;* which egg produces, II., a *larva*, which is a little animal called by various names, such as *maggot*, or *genæ. caterpillar.* or *canker; worm* or *grub*. The larva continues to feed until it is full grown, (changing its skin several times as it increases in size,) when it becomes, III., a *pupa*, *chrysalis*, *aurelia*, or *nymph*. In order to undergo this change, the larva either enters the earth as most naked maggots do, or like hairy caterpillars, spins for itself a web; but some caterpillars merely suspend themselves to a wall or rail. In this pupa or chrysalis state they remain during the winter without any symptoms of life, except when touched, until the substance of the enclosed larva has become perfected into the various members of its first parents, when, IV., the *imago* or perfect state of the insect is produced, such as a flesh-fly, a butterfly, a rose-moth, a click-beetle, a turnip-fly, &c.

Insects are divided into large masses named ORDERS; these are subdivided into lesser groups called FAMILIES; and these again comprise smaller companies called GENERA; and each of these consists of a greater or less number of SPECIES, which sometimes vary in size and colour, and such are termed VARIETIES.

The turnip-beetle belongs to the ORDER COLEOPTERA, so called from its wings being folded beneath two horny wing-cases. For certain scientific reasons dependent on its structure it is included in the FAMILY CHRYSOMELIDÆ, or golden beetles; and is one of about a hundred SPECIES forming the GENUS ALTICA, or HALTICA, a word which refers to the leaping powers of the genus. The *striped turnip-beetle* is scientifically named ALTICA NEMORUM, the latter word implying that this species frequents woods and groves; which were its haunts before the general cultivation of the turnip. In country places this little pest is called the turnip-fly, or flea; the earth-flea beetle: black-jack, &c.

From the careful investigations of Mr. H. le Keux, the habits of this little beetle first became known; previous to which the man of science as well as the practical agriculturist had been led into many false theories and erroneous applications of remedies,—results which usually accompany our ignorance, and can only be superseded by frequent and plain statements of real remedies, founded on a practical knowledge of the evil they are intended to remove.

Between April and September, the female deposits her eggs on the under-side of the rough leaves of the turnip: she lays probably about one egg daily; the eggs are very small, smooth, oval, and partaking of the colour of the leaf. In ten days they are hatched; and the little maggots begin at once to eat through the skin and to form winding burrows in the leaf, by feeding upon its pulp. These burrows (fig. 1) can be detected in their early stage by holding the leaf up to the light; but when the larvæ quit them, and the cuticles are withered, the burrows can be readily distinguished. The larvæ (fig. 2) are pale, fleshy, and cylindrical, with six pectoral feet, and a proleg at the apex: the head is furnished with jaws and large dark eyes, and the first and last segments

Fig. 2.

THE LARVA, OR CATERPILLAR.

Fig. 3.

THE PUPA, OR CHRYSALIS.

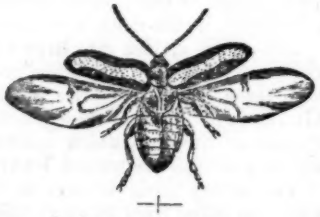
of the body are marked with black patches; they are fully fed in about sixteen days, when they quit their burrows and bury themselves about two inches below the surface of the earth, selecting a spot near to the bulb, where the turnip leaves protect them from wet and drought. Here they change into chrysalides, and probably in about a fortnight they are matured, when the beetle or fly, as it is called, quits its tomb, to attain that which, in insect life, is rather an old age; for the beetles have been kept from July until the following February. A single pair of beetles may have as many as five or six broods in a season.

The beetles are shining black, and covered with small dots: the head is rather small and has two round projecting eyes; the mouth projects a little, the upper lip and feelers being visible; just above the nose are placed two longish horns, each composed of eleven joints; the two wing-cases are moveable, and form an oval; each has an ochre-coloured stripe, sometimes approaching to white, running down the centre, generally winding a little on the outside near the middle, and curved inward at the extremity; beneath these wing-cases are the large wings, twice as long as the body, and folded up for pro-

Fig 4.

THE BEETLE, OR FLY, WALKING.

Fig. 5



THE SAME FLYING.

tection when unemployed; the legs are of a rusty ochre; the thighs pitch-coloured; the hinder thighs being very thick and formed for leaping. The mouth is furnished with two sets of teeth, or toothed mandibles, as they are named, which from their strength and horizontal action readily break the cuticle of the leaf. The beetles vary in length from one-tenth to one-sixteenth of an inch.

The turnip-beetle, in common with all the species of *Altica*, is distinguished by the great thickness of the hinder thighs, which confers on it the power of leaping to a great distance. The extent of its leap is about two hundred and sixteen times its own length. It seldom walks, and when at rest sits with its hind legs folded, ready to skip off in an instant if disturbed, or even when approached. In warm sunny weather it flies with ease.

This little plague is also common in Germany and Sweden. Mr. Curtis thinks it probable that in England no portion of the country is perfectly free from these insects, since every bank and meadow harbours them more or less, and they have been found also on grass lands which had not been ploughed for many years, and where there were no turnips within half a mile. But as soon as a turnip crop appears in its neighbourhood, the turnip-beetle will desert all other plants for it: and this insect appears to discover the turnip by an acute sense of smell. In a young crop the beetle destroys the two first smooth leaves, called the cotyledons, and the heart of the plant between them, by piercing them like a sieve, destroying the cellular tissue, and stopping the growth of the plant. They also feed upon the rough leaves, drilling them full of round holes (as shown in the figure), which are larger on the upper than the under side of the leaf; and if the appetite of the beetle be not satisfied, he enlarges the hole, and thus gives it an irregular form, which grows larger with the growth of the leaf. This is the origin of the large holes which may nearly always be seen on a turnip leaf.

The turnip-beetles live throughout the winter in a torpid state, and may be found under the bark of trees, beneath the fallen leaves, in the chinks of old timber and paling, the stumps of thorns and of other bushes in which the bark is not close to the stem; the hollow stems of grass also afford them a retreat during severe winter weather; but inactive as they then are, the warmth of the hand will revive them for a few minutes, and a warm sunny day such as often occurs in Winter or early Spring will seduce them from their retreats, and render them active for a while. But when Spring has fairly begun, if the weather be fine, they quit their winter retreats, and seek out sunny spots, where they may be seen in considerable numbers sitting on walls, or on dry banks, and on clods of earth protected from the wind: they have been seen in gardens as early as March; and in April on the crops in the fields; but their first and most fatal attacks are usually made during May and June. It has occasionally happened that the autumnal crops have been destroyed by them. Indeed they may be said to abound from May to October in all fields, whether of grass, wheat, oats, barley, or turnips,

The attacks of the turnip-beetle are by no means limited to the turnip: it prefers, however, those plants which are allied to the turnip, and called from the shape of their flowers *cruciferous*, or cross-bearing. Of these the leaves of the horse-radish, the common turnip, and the radish are its favourite food; but cabbages, cauliflowers, colewort, watercresses, ladies' smocks, and hedge mustard are often attacked: the charlock, or wild mustard, is also sometimes covered with them towards the end of April, and in May the leaves will be seen pierced with holes; but as soon as the turnips spring up, they desert other allied species. Hops, which belong to a different tribe of plants, are said to have been attacked by them. It is also stated that both summer and winter turnips left for seed, suffer in warm and dry weather from the attacks of the fly, injuring the flowers so as to spoil the produce of the seed. It was also long believed that the white spots or dots frequently observable on turnip seeds were the eggs of the turnip fly, and hence the seeds were steeped in brine or otherwise prepared, and sold at the seed-shops to insure the grower against the attacks of the fly. This, however, is now admitted to be a mistake; the white dots being probably the excrement of some minute insect, or particles of pollen from the flowers. The plan of steeping the seeds in oil, brine, brimstone, or milk, can have no effect in protecting the future plants from the attacks of the fly, except in rendering the plants stronger, or causing more of the seeds to vegetate, which at once accounts for the success said to be derived from the process of immersion.

In the next article on this subject, will be stated the remedies which have been proposed as effectual and economical against the attacks of the turnip-fly.

SEASONAL WILD FLOWERS.

APRIL.

There is a simple pure delight
Which the heart feasts on, in the sight
Of Nature when aside she throws
The wintry cearments that inclose
Her vegetable forms, and keep
Their senses in sepulchral sleep.

MANT'S *British Months.*

In this changing climate, Spring appears to advance with reluctance, so that many a time when we think we have bidden farewell to wintry winds, and sleety storms, they come back and take us by surprise, checking the early vegetation, and nipping the fair young flowers that begin to open to our view. Thus it is very frequently at the beginning of April, and we look in vain for any very evident increase of Spring tokens, the delicate-looking, but really hardy blossoms of the last month being alone able to bear up against the rigours of the "black-thorn winter," as this season is sometimes called, from the blossoming sloe which is peculiar to it. But long ere the month has come to an end, we find it justifying its title to the character of the "opening month of the year." The wild flowers begin to be more freely scattered, and we find blossoms opening faster than we can mark their appearance; indeed the young botanist is apt to feel bewildered as Spring advances, with the multiplicity of forms that attract his attention, demanding as they do, so much patient study, ere he can assign with certainty the rank and place they hold in the vegetable world. The best way, perhaps, to make a gradual advance in this delightful study, is to select a few examples of flowers that particularly attract our notice, and having made acquaintance with their names, and learned a few facts relating to their history, and the family and tribe to which they belong, to seek out such of their relatives as may be in blossom at the time, or may be found among our dried plants, and so get a little group, or several little groups, held together, as it were, by family ties, and therefore the more interesting objects of study.

Such groups may now be formed without much difficulty. The solitary member of the Speedwell family, noticed as blowing in February, may now be grouped with several newly arrived relations. The ivy-leaved Speedwell, or Small Henbit (*Veronica hederifolia*), grows in cultivated fields, as well as in woods, and among rubbish. It is an annual plant flowering from this period till December. It spreads on the ground, and has flat, and broadly heart-shaped leaves. The flowers are small, of a pale blue colour, diversified with lines of a deeper hue. The blunt-fingered Speedwell, or upright Chickweed (*Veronica triphyllos*), though a rare plant, may now be occasionally found in sandy fields, especially in the counties of Norfolk and Suffolk. It receives its name from the finger-like divisions of its leaves. The plant is three or four inches high, and is branched at the base, where the leaves are undivided and opposite each other, while at the top they are divided into three or five segments. The flowers are deep blue. The vernal Speedwell (*Veronica verna*), is also very rare. It was first found near Thetford and Bury in Suffolk; but as it is not likely to be met with by our readers we will not attempt to describe it.

The Speedwell family belongs to a tribe of extremely beautiful but suspicious plants, many of which are fatally poisonous, *i. e.*, the Fox-glove tribe, to which belong the curious Monkey-flowers (*Mimulus*), Slipper-flowers (*Calceolaria*), Snapdragons (*Antirrhinum*), and many other well-known plants. These plants all agree in essential characteristics, though they occasionally differ as to the form of the flower, the number of the stamens, and other subordinate points. In the next month we may make our Speedwell group more complete by the addition of several other species, such as the smooth, the common, and the beautiful Germander Speedwell. For the characters by which these are distinguished from the foregoing, we must refer our readers to Withering, or some other botanical work: our object here is merely to recommend this grouping of plants, from which we have ourselves in past years derived great delight. There is a peculiar pleasure in bringing together these pretty relatives, and tracing the family likeness between them, at the same time that we observe the distinct individual characters of the several species.

While the rose-tinted blossoms of the crab begin to adorn the hedgerow, and the sloe or black-thorn hides its leafless stalks beneath a profusion of white blossoms, and while the gardens present the lovely sight of the opening bloom of apple, peach, apricot, and nectarine, the scent and hue of lowlier blossoms are not wanting to grace the close of the month. In ordinary seasons some, if not all and more than all, the pleasant sights we speak of here are realized.

Not only that, where weak and scant
Peep'd forth the early Primrose plant,
Now shine profuse unnumber'd eyes,
Like stars that stud the wintry skies.
But that its sister Cowslips nigh,
With no unfriendly rivalry
Of form and tint, and fragrant smells,
O'er the green field their yellow bells
Unfold bedropt with tawny red,
And meekly bend the drooping head.

The Cowslip (*Primula veris*), and the Oxlip (*Primula elatior*), those beautiful relatives of the common primrose, are favourite flowers with our poets, so that we might multiply quotations in their praise. Perhaps the most fanciful description of the Cowslip is that contained in the following lines, where Shakspeare makes it subservient to the Queen of the Fairies, and alludes, it is supposed, to the institution of tall military courtiers, who were pensioned by Queen Elizabeth.

And I serve the fairy queen
To dew her orbs upon the green:
The Cowslips tall her pensioners be;
In their gold coats spots you see;
Those be freckles, fairy favours,
In those freckles live their savours:
I must go seek some dew-drops here
And hang a pearl in every Cowslip's ear.

But let us examine a little more nearly the small blossoms that mingle their varied tints on sunny banks at this season. We have spoken of the Speedwell, but there is a creeping plant, with purple blossoms, spreading itself at the foot of trees, and taking root at every joint, like the runners of the strawberry. The leaves are roundish, and notched at the edges, and the whole plant has a strong, but not unpleasing smell. This is the Ground-Ivy (*Glechoma hederacea*), belonging to the Mint tribe, and called by our Saxon ancestors *Ale-hoof*, because it was a chief ingredient in their ale. A decoction of this herb is still drunk by many persons, as a purifier of the blood, and the old writers tell us that it is also a fine strengthening eye-water, removing inflammations, smarting, and "any grief whatever."

Two species of Scorpion Grass (*Myosotis*) may also now be noticed. These are members of the same family as that truly beautiful plant the *Forget-me-not*, which does not appear till June. There are seven indigenous species of Scorpion Grass described by Sir J. E. Smith, three of which are annuals, the rest perennials. The species now in bloom are the early Field Scorpion Grass (*Myosotis collina*), growing in dry pastures, in sandy and gravelly soil, and on wall tops, with spreading flower-stalks, and small blue flowers; and the yellow and blue Scorpion Grass (*M. versicolor*). This species is so named from having a small blue blossom with a yellow throat. It is common in waste places, on walls, &c. In some of our botanical books it is spoken of as flowering in June and July; but it not

unfrequently shows itself thus early in the year. The name *Myosotis*, given to this family, means *Mouse-ear*, and is taken from a fancied resemblance of the leaves to the ear of the animal. We recommend the young botanist to try to make up this easy group during the season, (with the exception of that one species (*Myosotis alpestris*), which grows on Highland mountains, and may be considered rare,) taking care to dry each species as it comes in bloom.

In the southern parts of England that curious-looking flower the Fritillary or Snake's-head (*Fritillaria meleagris*). is found in a wild state, and now puts forth its purplish chequered bells. That rare plant the Spring Gentian (*Gentiana verna*), growing in barren and mountainous spots, is also now in blossom. But we turn from these less familiar names to notice

> The woodland Sorrel's petals pale,
> Veined with fine purple streaks.

Perhaps the little Wood-Sorrel may be considered the most elegant of all our wild flowers. It is not a universal plant in England, but where it does grow, it flowers abundantly. Extremely delicate is the stalk of the dried specimen, which well supplies to the writer the place of the growing plant: very lovely is the drooping, solitary, bell-shaped flower, white and almost of a gauzy texture, but veined with minute branchings of a purplish hue; bright, but delicate, is the green of the three little leaflets which unite to grace the purplish leaf-stalk; indeed it is a charming little plant, and well worthy of being cultivated in those districts where it is not found growing wild. It is called Sorrel on account of its pleasant acid taste which likens it to the common Sorrel, to which, however, it does not bear any outward marks of resemblance. The Wood-Sorrel (*Oxalis acetosella*) belongs to a small tribe of plants to which it gives its name, and it is itself noted for containing pure oxalic acid.

Now, too, we begin to observe in moist situations the early flowering species of a very remarkable tribe of plants, the Orchis tribe. The singular form of their flowers may have made them familiar to most of our readers, especially as some of the species have attracted special notice under the names *Bee orchis*, *Butterfly orchis*, &c., on account of the likeness to those insects exhibited in the lower lip of the flower. But the whole tribe is curious and interesting to the botanist on account of peculiarities of structure, which will be best estimated as described in scientific works. The species now in bloom, or rapidly approaching towards that state, are the Male Orchis (*Orchis mascula*), and the Spider Orchis (*O. aranifera*). From the tubers of the former species the nutritious substance called *salep* is prepared. These tubers are merely dried in an oven and pulverized, when they form a mucilage with boiling water. Dr. Lindley speaks of the Orchis tribe as containing decidedly the most curious and beautiful plants of a European Flora, and adds:—

> But it is in tropical countries, in damp woods, or on the sides of hills in a serene and equal climate, that these glorious flowers are seen in all their beauty. Seated on the branches of living trees, or resting among the decayed bark of fallen trunks, or running over mossy rocks, or hanging above the head of the admiring traveller, suspended from the gigantic arm of some monarch of the forest, they develope flowers of the gayest colours, and the most varied forms, and they often fill the woods at night with their mild and delicate fragrance. For a long time such plants were thought incapable of being made to submit to the care of the gardener, and Europeans remained almost ignorant of the most curious tribe in the whole vegetable kingdom. But it has been discovered of late years, that by care and perseverance they may be brought to as much perfection in a hot-house as they acquire in their native woods, and they now, under the name *Orchidaceous Epiphytes*, form the pride of the collections of England.

From the above extract our readers will gather that some of the species belonging to this tribe are parasites, or growing on, and deriving nourishment from other vegetables instead of taking root in the soil. Our native parasitical plants will come under review as we proceed.

We have already noticed the Colt's-foot, which sends up its leafless stalks and presents its yellow bloom in March. We may now find a singular-looking member of the same family, having the same habit of blowing before the leaves are developed. This is the Butterbur (*Tussilago petasites*), whose flowers appear during this month, growing upon round, thick, spongy stalks of a whitish colour, having a few scales growing upon them. A spike of pinkish flowers garnishes the top of each stalk, the whole not rising above eight inches in height. When the flowers have died away, the leaves rise, and are recognised by their large size, as well as by their being dark green above, whitish underneath, and standing singly upon their hollowed footstalks of a white, purple, or green hue. The root of this plant is white, long, and creeps under the surface of the ground.

Three species of the "bright-eyed Star of Bethlehem" come into blossom during the month. These belong to the Asphodel tribe, which contains the Onion and Hyacinth families, &c. The yellow, the common, and the drooping Star of Bethlehem, are the species now in flower. The first (*Ornithogalum luteum*) is met with sometimes, but not very frequently, in groves and pastures. It has an angular, two-leaved stem, and the flowers, which are yellow, tipped with green, grow in an umbel, this term being used to express that the flower-stalks, nearly of equal length, diverge from one common centre. The second (*O. umbellatum*) grows in meadows, pastures, and groves, in several parts of England. It never expands its flowers in gloomy weather, and even on bright days does not open till near noon; hence it has been called *Eleven o'clock Lady*. The flowers are white on the upper side, and green on the back, as are those of the next species. The third (*O. nutans*) grows mostly in fields and orchards, and is common in country gardens.

But we must here content ourselves with the brief sketch already given, nor seek to notice the various early flowering grasses, the trees and shrubs now putting forth their small blossoms, nor the remaining plants that might engage our attention.

The gradual unfolding of Spring foliage which occurs towards the end of the month is thus noticed by Bishop Mant:—

> Hail, April! Lo, inspired by thee
> Full many a lovely form I see
> Its long-lost garniture resume
> Of woodland leaf, or woodland bloom.
> No more with tassels here and there
> Besprent, but in a vesture fair
> The Larch to welcome thee is seen,
> Unmingled, of the tenderest green.
> Bright tints to welcome thee, adorn
> Of tenderest green the full-robed Thorn.
> Of broader lobes, and darker grain,
> His leaves for thee the Maple-Plane
> Develops from their crimson sheaths;
> For thee his bright and twisted wreaths
> Five-fingered, like a giant's hand,
> The Chesnut's lengthening shoots expand.
> Forth from his coral's ruby holds
> The Lime his pale green leaf unfolds.
> The Alder through the watery mead;
> About the mountain's rocky head
> The Birch for thee his leaves displays.
> And Elm and spreading Beech arrays,
> To grace thy course a thickening screen;
> This his smooth plates of glossy sheen;
> And, stateliest of the woodland realm,
> His rougher leaves the blossomed Elm.

John W. Parker, Publisher, West Strand, London.